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Society of London. In 1898 he received from Brown University the degree of Doctor of Laws. At the time of his death (Feb. 15, 1902) he was the Vice-president of Class II. of this Academy.

Endowed by nature with talents of a high order, he cultivated and, to use his own favorite phrase, accelerated their development and increase through his life. His strength of character is evinced by the forceful influence he exerted both in scientific and educational channels.

"*Talent*," says Baron Osten Sacken, the venerable diplomatist and naturalist, "is a gift of nature, and does not, for that reason, constitute in itself a merit; the merit lies in the *character* which makes talent fruitful." And that profound genius and master in biology — Von Baer — has said: "In the domain of Science, talent alone, coupled with diligence and *the power of self-control*, is of any value." *

We close this notice of our departed friend, who endeared himself to his associates so closely by his amiable and manly qualities, feeling sure that posterity will confirm the estimate here given of his worth as a man, and of the secure place he will hold as a master in science.

A. S. PACKARD.

JOHN DANIEL RUNKLE.

JOHN DANIEL RUNKLE was born at Root, N. Y., October 11, 1822, and died at Southwest Harbor, Me., July 8, 1902, near the close of his eightieth year.

The early years of life on the farm offered little opportunity for study, and he was already twenty-five when he entered the newly established Lawrence Scientific School of Harvard University. His name stands alone in the catalogue of 1848–49 as "student in mathematics." John W. Draper and James E. Oliver were fellow students; Josiah P. Cooke and William T. Harris, resident graduates. He was a member of the first graduating class, of 1851, with Joseph Le Conte and David A. Wells, receiving the degree of Bachelor of Science, and at the same time, for high scholarship, the honorary degree of Master of Arts.

The work of computation for the Nautical Almanac was carried on at this time in Cambridge by a staff including, among other men of subsequent eminence, Simon Newcomb, Asaph Hall, George W. Hill, T. H.

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* Quoted from "An Introduction to the Record of my Life-work in Entomology." By C. R. Von Osten Sacken. 1901.

Safford, and J. M. Van Vleck. Mr. Runkle's connection with the Almanac began in 1849, and continued in some form as late as 1884.

In 1852 he contributed to the "Astronomical Journal" papers on the "Elements of Thetis" and on the "Elements of Psyche."

In 1855 his "New tables for determining the values of the coefficients, in the perturbative function of planetary motion, which depend upon the ratio of the mean distances," were published as one of the Smithsonian Contributions to Knowledge.

In 1858 Mr. Runkle founded the "Mathematical Monthly." Encouragement was received and formal indorsement given by the American Association for the Advancement of Science and by several educational bodies. The list of contributors included many distinguished names, among others Arthur Cayley, William Chauvenet, George W. Hill, Simon Newcomb, Benjamin Pierce, John Herschel. The time for the publication of a long-lived mathematical journal was not, however, ripe, and only three volumes appeared.

From 1860 until his death Professor Runkle's time and strength were almost continuously and exclusively devoted to the establishment and upbuilding of the Massachusetts Institute of Technology. He was first Secretary of the Institute, and at the opening of the school became professor of mathematics. In October, 1868, he became Acting President in consequence of President Rogers' serious illness, and in 1870 he was made President, holding the office for the following eight years.

The situation was a most exacting one, making altogether exceptional demands. The school, only five years old, was in no condition to lose the guidance of its founder. It had not yet gathered the momentum necessary for steady, straightforward progress. Opinions did and will differ as to President Runkle's judgment on the difficult questions that, as time passed, pressed overwhelmingly upon him for solution. No man could have been more devotedly loyal to the school or to its founder, his predecessor and ultimately his successor. None could have shown more steadfast courage, not only against heavy odds, but too often with but feeble support.

The more notable events of the Runkle presidency were: the fruitless negotiations with Harvard University for a union; the establishment of the laboratories of mining engineering and metallurgy; the introduction of shop instruction and the foundation of the School of Mechanic Arts; the development of professional summer schools in the field; the beginnings of an engineering laboratory; the increased efficiency of military instruction and the summer encampment at Philadelphia in 1876; the erection of a gymnasium, including a lunch-room; the admission of women as students.

In 1878 Dr. Runkle resigned the presidency of the Institute and spent the following two years in Europe.

It had been President Runkle's merit to be the first to appreciate the American need of mechanic arts instruction based on principles already successfully applied in Russia. He was primarily interested in it as an invaluable addition to existing engineering courses, but he also saw clearly its great potential significance for general secondary education, and so far as possible, under pressure of other needs, demonstrated this by the inauguration of the School of Mechanic Arts, in which boys of high-school age were offered a two years' course, including mathematics, English, French, history, mechanical and freehand drawing, and shop-work. His visit to Europe enabled him to make a study of Continental schools of similar purpose ; and the results of this study are embodied in a paper presented to the Society of Arts in April, 1881, on " Technical and Industrial Education Abroad," in an extended contribution to the Report of the Massachusetts Board of Education for 1880–81, and in a " Report on Industrial Education " in 1884. Others have taken a more directly prominent share in the introduction and extension of mechanic arts or manual training in primary and secondary schools, but the actual experiment initiated by him in Boston had in its time wide influence and imitation.

As a teacher of mathematics, Professor Runkle found his highest usefulness and most congenial vocation, — a vocation to be happily continued for not less than twenty-one years. His teaching was characterized by stimulating, luminous, unconventional exposition, by quick incisive questioning, by warm personal interest in his students, and by a constant substratum of uplifting earnestness and dignity. None of his students could fail to acquire admiring affection; very few could withstand the incentive to work.

Professor Runkle was a man of much intellectual quickness and strength, of ardent, but in later years serene, temperament, of warm and generous affections, of cordial, unaffected courtesy, in all the relations of life a sincere and loyal gentleman. Throughout his early and middle life he was a pioneer, first in the struggle for his own education and that of his brothers, next in the establishment and continuance of a much-needed, but, as it turned out, premature mathematical journal, then and for many years in the development of the Massachusetts Institute of Technology, and the introduction of education in the mechanic arts. In all these undertakings his insight and courage were invaluable. He made President Rogers' plans for the Institute his own. He held steadfastly to its fundamental ideals, and, taking account of his scanty resources, made remarkable progress toward their fulfilment. The main changes he initiated have been abundantly justified by time, and he lived to see their fulfilment.

He was elected a Fellow of the Academy on the 26th of May, 1857, and served one year (1877–78) as Councillor.

New members elected are: Resident Fellows, 6; Associate Fellows, 3; Foreign Honorary Members, 5. The roll of the Academy now includes 197 Resident Fellows, 98 Associate Fellows, and 72 Foreign Honorary Members.*

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* By the resignation of a Resident Fellow, the death of an Associate Fellow and a Foreign Honorary Member, and the election of new members at the annual meeting of May 13, 1903, the roll stands at date of publication, 198 Resident Fellows, 98 Associate Fellows, 72 Foreign Honorary Members.